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vantage of photography in entomological illustration, expressing the opinion that a fair photograph reproduced by the half-tone process is in many instances better than a poor drawing, but that the best photographs he had seen reproduced in this way were by no means equal to drawings made by competent artists. Such a photograph as the one exhibited, however, marks a great advance on previous efforts of the kind and would be invaluable at least as an aid to the artist, and if transferred by photography to a wood block and then handled by a competent wood engraver would obviate all necessity for drawing and would produce the most satisfactory results which could be obtained, since the slight failures in details could be easily rectified by the engraver.

Dr. Gill mentioned the resemblance of certain coleopterous larvæ to certain Trilobites, especially among the Staphylinidæ. He said he had been struck by this resemblance in a figure of a *Silpha* larva, even the antennæ resembling the antennæ of Trilobites as recently discovered by Beecher. He mentioned the figure of *Fluvicola*, an Isopod crustacean, in De Kay's volume on the 'Crustacea of New York, and Le Conte's conclusion that it was the larva of *Psephenus*, and asked for further information as to this resemblance.

Mr. Schwarz said that this wonderful resemblance extends through several families of Coleoptera. He instanced *Micropeplus* among the Staphylinidæ, a genus of Scydmanidæ figured by Meinert, various genera of Endomychidæ, groups of species in the old genus *Silpha* *Psephenus* and *Helichus* among the Elmidæ, and various genera of the Dasyllidæ and Lampyridæ. The resemblance is largely caused by the exfoliation of the sides of the body. What its function is he did not know, some of the larvæ possessing it being aquatic, some sub-aquatic and some terrestrial.

The first paper of the evening, by Dr. Dyar, was entitled 'On the Fluctuations of the Postspiracular Tubercle in Noctuid Larvæ.'

The second paper included a continuation of Mr. Hubbard's letters from the Southwest, presented with notes and comments by Mr. Schwarz. The letters read at this time related to the Colorado Desert and to Salton Lake and

its insect fauna. Some discussion ensued on the question as to whether the Colorado Desert has been occupied at any modern period by an arm of the sea, Messrs. Vaughan, Schwarz and Gill taking part.

L. O. HOWARD,
Secretary.

THE ACADEMY OF SCIENCE OF ST. LOUIS.

At the meeting of the Academy of Science of St. Louis of March 6, 1899, Professor J. H. Kinealy described some experiments on lifting water by means of compressed air, as is done by the Pohle air-lift pump, and discussed the efficiency problems of the use of apparatus of this description. Three persons were elected to active membership.

WILLIAM TRELEASE,
Recording Secretary.

DISCUSSION AND CORRESPONDENCE.

THE IMPORTANCE OF ESTABLISHING SPECIFIC PLACE-MODES.

TO THE EDITOR OF SCIENCE—*Sir*: I use the word 'place-mode' to embody a well-known idea, namely, that a species has a different *mode* (*i. e.*, a different *prevailing* condition of size, color, etc.) in different localities. The person who seeks to determine a place-mode determines the prevailing dimension of the principal measurable qualities (and practically all qualities of organisms are measurable) of a species as it occurs in the locality in question.

The importance of this work is as follows: It fixes the condition of a species in a particular locality at a particular time; it affords a base from which we may measure any change which the species has undergone in the same locality after a certain number of years. That species in nature do undergo changes within a man's lifetime is recognized by some conchologists who find that certain shells of the seashore have undergone within a half century an evident change of index (ratio of length to breadth). A case of especial interest because of the exact measurements which have been made is that of the rock crab of Plymouth, England, the frontal breadth of whose carapace has diminished year by year at a measurable rate (1 to 2 per cent. in five years), a result explained by certain

changes in the physiography of the region (Weldon). Such facts indicate that species are changing in essential specific characters and sometimes rather rapidly changing. The changes are not sufficient to be detected in cases where the descriptions are wholly qualitative or based upon the observation of a few individuals. But where a large number of individuals, taken at random, are measured the modes may be used as standards for reference. With the aid of such standards we can observe not only the fact of change, but the rate and the direction, and draw conclusions concerning the causes of specific change. If two modes occur in a species in one locality we can determine whether they separate farther and farther from each other, and the rate of such separation. A careful correlation of the facts of separation of modes with changes in environment will give us an insight into the causes of specific differentiation. In a word, the establishment of these place-modes for various species in various localities is the first sure step toward the solution of the problem of the Origin of Species.

The methods of this work are very simple. They involve the measurement of size, of proportions and other elements of form, and of color, by the color wheel;* they involve also counting repeated organs. The measurements, or counts, are to be grouped into classes on the basis of size. The means of measurement will naturally be found; but, most important of all, far more significant than the mean, is the *mode* or the *most frequented* class. The mode gives the typical condition of the lot of individuals measured.

The end of the old century or the beginning of the new one is a convenient time for making a number of these determinations, and it is on this account that I write to suggest to field naturalists that for a year or two they bend their efforts to the determination of place-modes. I am so convinced of the importance of this work that I am planning, with the cooperation

*The color wheel is an instrument for determining the percentage of constituent elementary colors in any compound color. A small, cheap and convenient form of this instrument—called the color top—with standard colors may be bought for six cents of The Milton Bradley Company, Springfield, Mass.

of students, to work on this subject at the laboratory at Cold Spring Harbor during the coming summer, and I hope that simultaneous co-operative observations may be made at Woods Holl and other marine laboratories as well as at the various inland stations and by private collectors elsewhere. There is no fear of duplication of work, for two persons will hardly study the same species in one and the same locality.

CHAS. B. DAVENPORT.

HARVARD UNIVERSITY, March 2, 1899.

IDENTITY OF COMMON AND LABRADOR WHITEFISH.

THE Common Whitefish of the Great Lakes was first very imperfectly described by Dr. Samuel L. Mitchill, in *The American Monthly Magazine and Critical Review* for March, 1818. The description, in fact, is so unsatisfactory that his contemporaries and later ichthyologists for more than fifty years supposed it to refer to the Cisco, or Lake Herring, *Argyrosomus artedii*. A good account of the Whitefish was published by Richardson in 1836, under LeSueur's name of *Coregonus albus*, a name published only a few weeks later than that of Mitchill; but, like Mitchill's, unaccompanied by a sufficient description.

In 1836 Richardson established a new species of *Coregonus* upon a dried specimen which he received from Musquaw River, that falls into the Gulf of St. Lawrence, near the Mingan Islands, giving it the name *Salmo (Coregonus) labradoricus*. This has been retained in the literature as a distinct species up to the present time, although its close relationship to the Common Whitefish has sometimes been observed without recorded comment.

Systematic ichthyologists have found it difficult to show clearly the differences between the Common Whitefish and the Labrador Whitefish, as may be seen by referring to the monographs upon the Whitefishes by Jordan and Gilbert, Bean, and Evermann and Smith. They have been forced to rely, finally, upon a single character, the presence of several rows of teeth on the tongue to distinguish the two forms, and this was supposed to be constant and infallible.

The writer has recently had occasion, while